WHAT IS CLAIMED IS:

1. A process of designing an optimal vibration mount for a disc drive comprising steps of:

a) computing an external disturbance model for the disc drive;

b) computing an internal disturbance model for the disc drive;

c) defining an inertia matrix for the disc drive;

d) defining a state estimator based on the inertia matrix and external and internal disturbance models to minimize a defined norm of a state estimation error;

e) calculating the gain of the state estimator as a solution to a filter algebraic Riccati equation; and

f) defining optimal mount damping and stiffness parameters based on the calculated state estimator gain.

2. The process of claim 1, wherein step (e) includes,

e1) calculating a covariance matrix based on the solution to the filter algebraic Riccati equation, and

e2) calculating the state estimator gain based on the covariance matrix.

3. The process of claim 1, wherein step (e) is performed by

(e1) calculating a covariance matrix Σ from a solution of the filter algebraic Riccati equation in the form

$$\begin{pmatrix}0 & I\\ 0 & 0\end{pmatrix}\Sigma+\Sigma\begin{pmatrix}0 & I\\ 0 & 0\end{pmatrix}'+\begin{pmatrix}0\\ M^{-1}\end{pmatrix}\Xi\begin{pmatrix}0\\ M^{-1}\end{pmatrix}'-\Sigma\begin{pmatrix}0 & I\end{pmatrix}'\Theta^{-1}\begin{pmatrix}0 & I\end{pmatrix}\Sigma=0,$$

where M is the inertia matrix, Θ is the internal disturbance matrix and Ξ is the external disturbance matrix, and

(e2) calculating the state estimator gain H from $H=\Sigma\begin{pmatrix}I & 0\end{pmatrix}'\Theta^{-1}$.

4 The process of claim 3, wherein step (f) is performed by

f1) solving $H = \begin{pmatrix} M^{-1}B \\ M^{-1}K \end{pmatrix}$ for B and K, and

f2) setting the optimal mount damping matrix to B and the optimal mount stiffness matrix to K.

5. The process of claim 1 wherein the state estimator is a Kalman filter.

6. The process of claim 5, wherein step e) includes,

e1) calculating a covariance matrix based on the solution to the filter algebraic Riccati equation, and

e2) calculating the Kalman filter gain based on the covariance matrix and the inertia matrix.

7. The process of claim 6, wherein step (e) is performed by

(e1) calculating a covariance matrix Σ from a solution of the filter algebraic Riccati equation in the form

$$\begin{pmatrix} 0 & I \\ 0 & 0 \end{pmatrix}\Sigma + \Sigma\begin{pmatrix} 0 & I \\ 0 & 0 \end{pmatrix}' + \begin{pmatrix} 0 \\ M^{-1} \end{pmatrix}\Xi\begin{pmatrix} 0 \\ M^{-1} \end{pmatrix}' - \Sigma(0 \quad I)'\Theta^{-1}(0 \quad I)\Sigma = 0,$$

where M is the inertia matrix, Θ is the internal disturbance matrix and Ξ is the external disturbance matrix, and

(e2) calculating the Kalman filter gain H from $H = \Sigma(I \quad 0)'\Theta^{-1}$.

8. The process of claim 7, wherein step (f) is performed by

f1) solving $H = \begin{pmatrix} M^{-1}B \\ M^{-1}K \end{pmatrix}$ for B and K, and

f2) setting the optimal mount damping matrix to B and the optimal mount stiffness matrix to K.